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Attention:

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Subject: Progress Reports,
Submission ofEnclosure: (A) Progress Reports for
the month of May, in
quadruplicate

Gentlemen:

Pursuant to the terms and provisions of the applicable task orders, the contractor submits Enclosure (A), described above, detailing the progress achieved during the month of May 1960.

In the event further information is desired concerning the enclosed reports, do not hesitate to contact the writer.

Very truly yours,

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Assistant Director
Contract Administration Division

GWB:NKG:dw

cc:

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Attention:

w/enclosure

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The E-plane radiation patterns of the horn become split as the frequency is increased through 18,000 mc. This is caused by two factors: (1) the abrupt transition from waveguide to horn taper, and (2) the presence of the dielectric fin in the H-plane of the horn. The first of these may be corrected by (a) lengthening the tapered portion of the horn, and (b) reducing the E-plane flare of the horn resulting in an aperture that is rectangular rather than square. Correction (a) will increase the gain of the horn and correction (b) will decrease the gain of the horn. The second factor is being studied to determine whether or not the fin is necessary to the proper operation of the antenna.

Computations have continued on the filter synthesis program.

Future Plans: Work in all phases will continue. Since the weather has cleared up it is possible to devote more time to the testing of the 10,000 mc to 40,000 mc horn antenna for which the portable EHF signal generators must be placed outdoors on the range tower.

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**PROGRESS REPORT
FOR
MONTH OF MAY 1960**

BROADBAND ANTENNA, FILTER AND DETECTOR SYSTEMS

Purpose: To develop a system of antennas, filters and detectors for the 50 mc to 40,000 mc frequency range.

Personnel: Electrical Engineers:

Mechanical Engineer:

Mathematicians:

Status: A new technique is being employed for etching the 50 mc to 500 mc aluminum coated mylar antenna which does not deposit a hard and brittle film on the mylar. This should alleviate the problems associated with the flexibility of the antenna.

Final system testing of the 500 mc to 10,000 mc printed circuit antennas will be delayed until suitable bandpass filters have been developed. Radiation patterns and impedance measurements have been completed on the antennas.

Work has continued on the 10,000 mc to 40,000 mc horn antenna, detector and dielectric waveguide inserts. The model of the detector which is an integral part of the horn assembly is being tested. Preliminary testing indicates that there is a degradation in tangential sensitivity in the frequency range 27,000 mc to 32,000 mc. The tangential sensitivity in this range is approximately -27 dbm while in the rest of the frequency range it is from -38 dbm to -45 dbm. Further testing is underway to determine the modifications necessary to correct this degradation.

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